

REMARKS

Claims 2-5, 7, 10, 14, 17, 18 and 21 are pending in the present application. Claim 14 has been amended.

Applicant respectfully requests reconsideration of the application in view of the foregoing amendments and the remarks appearing below, which Applicant believes places the application into condition for allowance.

Claim Objection

Claim 14 stands objected to because it depends from a canceled claim. As the Examiner correctly indicates, claim 14 should depend from independent claim 10. Applicant has amended claim 14 herein to depend from claim 10 as indicated. Therefore, Applicant respectfully requests withdrawal of the present rejection.

Rejections Under 35 U.S.C. § 102

Kitamura et al.

Claim 21 stands rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,508,879 to Kitamura et al., on the assertion that Kitamura et al. disclose all of the limitations of this claim. Applicant respectfully disagrees.

Kitamura et al. disclose a charge removal brush for removing electrical charges and/or removing residual toner, and electrical charges associated therewith, from transfer drums and other components of a Xerography image-forming apparatus, such as copying machines and printers.

In rejecting claim 21, on page 3 of the Office Action the U.S. Patent and Trademark Office (USPTO) asserts that this claim merely recites an intended use of the claimed apparatus, i.e., the apparatus is “for cleaning surface contaminants from a microelectronic wafer.” The USPTO then states on the same page:

If the prior art structure is capable of performing the intended use, then it meets the claims. Thus since the device of Kitamura teaches the structure that is capable of cleaning a wafer, it meets the claim. Additionally, the wafer is not positively claimed and therefore, since Kitamura is capable of cleaning a wafer since the reference comprises all the structural elements of the claim, the limitation regarding the use holds no patentable weight.

While Applicant agrees with the general principle underlying the just-quoted statements, Applicant respectfully disagrees with this principle's applicability to claim 21.

As Applicant respectfully asserted in a prior Response, claim 21 does not merely recite microelectronics wafer cleaning as an intended use. Rather claim 21 positively claims in its body that the apparatus comprises “a wafer cleaning region configured to receive a microelectronics wafer during cleaning.” [Emphasis added.] This limitation clearly requires that the apparatus have a region that receives a microelectronics wafer during cleaning. The Kitamura et al. printers and copiers certainly do not have such physical structure. The Kitamura et al. printers and copiers are clearly devices for printing on paper. Therefore, various parts of the Kitamura et al. devices are configured for receiving individual sheets of paper, which are highly flexible. In this connection, witness the circuitous path in virtually any printer and copier, including the Kitamura et al. devices, that include various rollers, drums, and other components that take advantage of the flexible nature of sheets of paper. Clearly, a microelectronics wafer, which is well known to be rigid, cannot be run through the Kitamura et al. printer/copier because it would either break or jam because it could not conform to the circuitous path that the sheets of paper can easily follow. Therefore, the Kitamura et al. devices cannot be fairly said to have a “wafer cleaning region configured to receive a microelectronics wafer during cleaning” as required by claim 21.

In addition, claim 21 requires “a conductive rotating wafer-cleaning member designed to contact the microelectronics wafer during cleaning so as to remove surface contaminants from the microelectronics wafer during cleaning.” Kitamura et al. simply do not disclose this limitation. This is so for a number of reasons, including the fact that none of the Kitamura et al. embodiments disclose a conductive rotating wafer-cleaning member suitable for microelectronics wafer cleaning, nor a conductive rotating wafer-cleaning member located anywhere suitable for cleaning a microelectronics wafer. Regarding the latter, FIGS. 4-7 of the Kitamura et al. patent show various locations for a charge-removing brush in a printer/copier. In FIGS. 4 and 5, cleaning brush 112 is provided for cleaning/removing electrical charge from a drum-type photoreceptor 102 of a laser-printing device. There is no reasonable way to assert that brush 112 in the location shown could be used to clean a microelectronics wafer (note the circuitous paper path in FIG. 5). Similarly, FIG. 6 shows a cleaning brush 210 in contact with a transfer drum 220 of a multi-color printing device. Here, too, note the circuitous paper path.

There is no reasonable way to assert that brush 210 could be used to clean a microelectronics wafer. FIG. 7 shows a charge-removing brush 310 in contact with a paper-transport belt 320 on the underside of the belt assembly. Note here, too, the circuitous nature and location of the paper path that is away from the location of brush 310. Again, it cannot be fairly said that brush 310, especially in the remote location shown, is “designed to contact the microelectronics wafer during cleaning so as to remove surface contaminants from the microelectronics wafer during cleaning,” as required by claim 21.

In these connections, the USPTO is reminded that for an anticipation rejection to be proper, not only must every element be found in a single reference, but the reference must also teach the exact arrangement of the claim elements as that arrangement is set forth in the claims. See MPEP § 2131. Here, it is clear that Kitamura et al. do not even contemplate an apparatus having a wafer cleaning region.

Moreover, Applicant understands that features that are not explicitly disclosed in an anticipatory reference may be used to reject a claim under certain conditions. Applicant emphasizes, however, that the undisclosed features must indeed be inherent. In the present rejection, Applicant respectfully asserts that, especially in view of the foregoing description of what Kitamura et al. are and are not, the Kitamura et al. paper printers and copiers do not inherently possess wafer cleaning regions configured to receive a microelectronics wafer during cleaning, nor conductive rotating wafer-cleaning members designed to contact a microelectronics wafer during cleaning so as to remove surface contaminants from the microelectronics wafer. Indeed, if this were so, anyone could simply insert a microelectronics wafer into a paper printer or copier to clean the wafer. This is clearly nonsensical.

For at least the foregoing reasons, Applicant respectfully requests that the Examiner withdraw the present rejections of claim 21.

Rejection Under 35 U.S.C. § 103(a)

Bahten/Hawn/Luhr et al.

Claims 2, 3, 7, 10-14, 17, 18, and 21 stand rejected under 35 U.S.C. § 103(a) as being obvious in view of a combination of U.S. Patent No. 6,182,323 to Bahten, Hawn IBM Technical Disclosure Bulletin and U.S. Patent No. 6,743,721 to Lur et al. The USPTO asserts that Bahten teaches all of the limitations of these claims, except for the feature of electrically grounding the rotating microelectronics wafer cleaning member. Applicant respectfully disagrees.

Bahten discloses porous polymeric scrubbing brushes for cleaning particulate contaminants from, among other things, microelectronics wafers. Bahten also discloses that these brushes are used in wafer cleaning apparatuses. The Bahten brushes are made of polymers, such as polyvinyl acetal and polyurethane, containing very little impurities.

The Hawn Bulletin describes removing unwanted electrostatic charges from photoconductive plates using a soft grounded brush with multiple conductive points that come into intimate contact with the surface being discharged.

Lur et al. disclose a microelectronics wafer having a dielectric surface.

Turning now to the rejected claims, independent claim 21 requires, among other things, “a conductive rotating wafer-cleaning member” and “an electrical grounding path extending from the microelectronic wafer through said conductive rotating wafer-cleaning member to an electrical ground when the apparatus is connected to an electrical ground.” The current Office Action makes an assertion relative to the rejection of claim 3 on page 4 of the current Office Action that Applicant believes is relevant to this rejection and requires correction. On page 4 of the current Office Action, the USPTO asserts that “foam is conductive.” This is simply not true of the foam scrubbing brushes disclosed by Bahten. Indeed, Bahten discloses two aspects regarding the material of the Bahten foam brushes. First, Bahten discloses that the foams are polymeric and made mainly of either polyvinyl alcohol (col. 3, lines 31-34) or polyurethane (col. 4, lines 26-27). Applicant notes that both of these materials are commonly known as insulators. Second, Bahten indicates that the materials of the Bahten foam brushes have very low levels of impurities compared with conventional brushes (see Bahten’s Tables 1A and 1B). Indeed, Bahten infers that the low levels of impurities present in the Bahten brushes that are detrimental to integrated circuits result in brushes that are superior to conventional brushes (see col. 4, lines 55-59). From both of these facts, it is clear that the Bahten foam brushes are not conductive.

Applicant respectfully asserts that to sustain a rejection of claim 21, the proposition that Bahten’s foam brushes must be made conductive must be valid. This is so because as mentioned above, claim 21 requires the limitation of “a conductive rotating wafer-cleaning member.” Since the USPTO uses the Bahten patent to show the claim limitation of a microelectronics wafer cleaning brush, the Bahten brush must be modified to be made conductive for the rejection to make sense. However, that proposition is indeed not valid because the only reasonable way to make Bahten’s foam brushes conductive would be to add a conductive filler material. Since

adding such a conductive filler would destroy Bahten's teachings of very low impurity foams, the proposition cannot be valid. See, e.g., MPEP 2143.01(V) (the proposed modification cannot render the prior art unsatisfactory for its intended purpose).

In this case, adding impurities (quite a lot of conductive impurities would be necessary) to the low-impurity Bahten foam brushes would render Bahten's intentionally very-low-impurity brushes unsatisfactory for their intended purpose of providing cleaning capability with very-low-impurity brushes. Applicant respectfully asserts that because making the Bahten foam brushes conductive would render them unsatisfactory for their intended purpose, the proposed combination is not valid. Therefore, the asserted combination is not proper and does not render obvious independent claim 10, nor claims 2, 3, and 7 that depend therefrom.

Regarding independent claim 10, this claim requires among other things the step of "cleaning said surface of said microelectronics wafer with a conductive rotating wafer-cleaning member." For essentially the same reasons just discussed relative to the rejection of independent claim 21, the asserted combination cannot render obvious independent claim 10, nor claim 14 that depends therefrom.

Regarding independent claim 17, this claim requires among other things "a conductive rotating wafer-cleaning member." For essentially the same reasons discussed above relative to the rejection of independent claim 21, the asserted combination cannot render obvious independent claim 17, nor claim 18 that depends therefrom.

For at least these reasons, Applicant respectfully requests that the Examiner withdraw the present rejection.

Bahten/Hawn/Luhr et al./Kitamura et al.

Claims 4 and 5 stand rejected under 35 U.S.C § 103(a) as being obvious in view of a combination of the Bahten, Hawn Bulletin, Lur et al., and Kitamura et al. references, each discussed above. Applicant respectfully disagrees.

The Bahten, Hawn Bulletin, and Lur et al. references are as described above relative to the obviousness-type rejection in view of these three references.

The Kitamura et al. patent is also as described above relative to the anticipation rejection. In addition, the Kitamura et al. charge removal brush includes a number of long, conductive filamentous elements for removing charges from an object when the charge removal brush comes in contact with the object, is disclosed. The charge removal brush includes a metal shaft

rotatable about the axis thereof, a strip-like woven cloth including a base cloth and long conductive filamentous elements uniformly planted in the substantially entire surface of the base cloth, the strip-like woven cloth being spirally wound on the metal shaft with no gap, and a conductive fiber is woven into the base cloth in a state that the conductive fiber runs along the center line of the base cloth, which is extended in the lengthwise direction of the base cloth.

As discussed above relative to the obviousness-type rejection in view of the Bahten/Hawn/Lur et al. combination, Applicant believes that the Bahten/Hawn/Lur et al. combination is improper relative to the claims from which claims 4 and 5 depend. The additional combination with the Kitamura et al. patent, in Applicant's view, does not remedy the shortcomings of the Bahten/Hawn/Lur et al. combination. Consequently, it is Applicant's position that the Bahten/Hawn/Lur et al./Kitamura et al. combination does not render claims 4 and 5 obvious.

For at least this reason, Applicant respectfully requests that the Examiner withdraw the present rejection.

CONCLUSION

In view of the foregoing, Applicant submits that claims 2-5, 7, 10, 14, 17, 18, and 21, as amended, are in condition for allowance. Therefore, prompt issuance of a Notice of Allowance is respectfully solicited. If any issues remain, the Examiner is encouraged to call the undersigned attorney at the number listed below.

Respectfully submitted,

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